

Application No.: 10/779,438

Case No.: 56873US002

REMARKS

Claims 1-47 are pending.

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§ 103 Rejections

Claims 1-47 stands rejected under 35 USC § 103(a) as being unpatentable over McCullough et al. (US 6,344,270) in view of Hannen (US 6,047,586).

The rejection of claims 1-47 under 35 USC §103(a) as being unpatentable over '270 (McCullough et al.) in view of '568 (Hannen) is unwarranted and should be withdrawn.

It is said in the Office Action that '270 (McCullough et al.) teaches a composite wire or cable that includes fiber reinforced metal matrix composites comprising a core containing at least one tow comprising a plurality of substantially continuous, longitudinally positioned reinforcing fibers of ceramic or carbon which is encapsulated within a metal matrix. Specific reference is made to col. 3, lines 31-45. Further, it is said '270 (McCullough et al.) teaches that the wire or cable may have a metal covering the metal matrix composite core. Specific reference is made to col. 9, lines 21-65, and Figures 4-5. It is also said in the Office Action that '270 (McCullough et al.) does not exemplify an embodiment wherein the metal matrix composite core comprises a metal cladding.

With regard to '568 (Hannen), it is said this document teaches that a composite wire or cable that includes fibers 2 disposed in a metal matrix 1. Specific reference is made to col. 47 (understood to be col. 4; if this is incorrect, correction is requested), lines 3-19. Further, it is said '568 (Hannen) teaches that a ductile outer cladding 4 may be provided on the composite wire to provide beneficial properties such as enhanced corrosion resistance or to act as an insulation layer. Specific reference is made to col. 4, lines 10-19.

Further, it is alleged in the Office Action that it would have been obvious to one of ordinary skill in the art to have modified the composite wire or cable of '270 (McCullough et al.) by following the teaching of '568 (Hannen) of cladding the wire with a ductile layer to enhance the properties of the wire such as by providing increased corrosion resistance with a reasonable expectation of success.

It is also said in the Office Action that '270 (McCullough et al.) teaches the wire or cable has a roundness value of at least 0.95, a roundness uniformity value of not greater than 1.5%, and a diameter uniformity value of not greater than 0.5% over a length of at least 100 meters. Specific reference is made to col. 1, line 57 to col. 2, line 6. Further, '270 (McCullough et al.) is said to exemplify embodiments wherein the roundness uniformity value is as low as 0.94% and

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the diameter uniformity value is 0.21%. Specific reference is made to Table 1, runs 12 and 6 respectively.

The Office Action goes on to state that although the prior art does not exemplify embodiments having the claimed properties, it teaches the claimed properties as being maximum or minimum values with no upper or lower limit boundaries being specified. As such it is said, it would have been obvious to one of ordinary skill in the art to have formed the metal-clad metal matrix composite wires having a roundness uniformity value lower than the 1.5% and a diameter uniformity value lower than the 0.5% including having values within the ranges claimed by Applicant. Furthermore, it is said '270 (McCullough et al.) exemplifies embodiments having values that are so close that prima facie one skilled in the art would have expected them to have the same properties. Specific reference is made to Titanium Metals Corporation of America V. Banner, 227 USPQ 773.

In addition, it is said in the Office Action that Applicant argues that '270 (McCullough et al.) does not teach the structure of a wire or cable as claimed having a metal cladding covering the metal matrix composite core. Further it is said, that while '270 (McCullough et al.) does teach a tape overwrap 83 and conductor layers 93A and 93B (reference is made to Figures 4 and 5), it does not explicitly recite the use of a metal cladding on the composite core structure. However, it is alleged that '568 (Hannen) teaches that the use of a metal cladding on a composite core structure comprising fibers in a metal matrix is known for providing the formed wire with enhanced properties. As such, it is concluded it would have been obvious to one of ordinary skill in the art to have modified the composite wire or cable of '270 (McCullough et al.) by following the teaching of '568 (Hannen) of cladding the wire with a ductile layer to enhance the properties of the wire such as by providing increased corrosion resistance with a reasonable expectation of success.

Applicants in independent claim 1, claim a metal-cladded metal matrix composite wire comprising:

a metal matrix composite core having an exterior surface, the metal matrix composite core comprising:

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at least one tow, wherein the tow comprises a plurality of continuous fibers that are oriented longitudinally with respect to each other, the fibers comprising at least one of ceramic or carbon;
a metal matrix, wherein each tow is positioned within the metal matrix;
and
a metal cladding covering the exterior surface of the metal matrix composite core,
wherein the metal cladding has a melting point not greater than 1100°C,
wherein the metal-cladded metal matrix composite wire, exhibits a roundness value of at least 0.95, a roundness uniformity value of not greater than 0.9%, and a diameter uniformity value of not greater than 0.2% over a length of least 100 meters.

Further, Applicants in independent claim 25, claim a metal-cladded aluminum matrix composite wire comprising:

an aluminum matrix composite wire having an exterior surface, the aluminum matrix composite wire comprising:
at least one tow, wherein the tow comprises a plurality of continuous fibers that are oriented longitudinally with respect to each other, the fibers comprising at least one of ceramic or carbon;
an aluminum matrix, wherein each tow is positioned within the aluminum matrix; and
a metal cladding covering the exterior surface of the aluminum matrix composite wire, wherein the metal cladding has a melting point not greater than 1100°C,
wherein the metal-cladded aluminum matrix composite wire, exhibits a roundness value of at least 0.98, a roundness uniformity value of not greater than 0.5%, and a diameter uniformity value of not greater than 0.2% over a length of least 100 meters.

The Office Action acknowledges that '270 (McCullough et al.) does not exemplify an embodiment wherein a metal matrix composite core comprises a metal cladding. Hence, even assuming arguendo the other features of the independent claims were taught or suggested by that

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'270 (McCullough et al.), '270 (McCullough et al.) alone fails to teach the inventions claimed in the independent claims. Further, it is understood that in view of the withdrawal of the rejection in the previous Office Action based on '270 (McCullough et al.), the Examiner agrees that '270 (McCullough et al.) properly suggest, and hence, does not render obvious, the inventions claimed in the independent claims.

Turning to '568 (Hannen), it is unclear how or where this document teaches or suggests "the use of a metal cladding on a composite core structure comprising fibers in a metal matrix [for the known purpose of] providing the formed wire with enhanced properties" as alleged in the Office Action. For example, Applicants in claim 1 require, in part, a metal matrix composite core; and in claim 25, an aluminum matrix composite wire. It is said in the Office Action that '568 (Hannen) "teaches that a composite wire or cable that includes fibers 2 disposed in a metal matrix 1." Specific reference is made to col. 47 (understood to be col. 4; if this is incorrect, correction is requested), lines 3-19. Applicants, however, can find no teaching in col. 4, lines 3-19 of '568 (Hannen) of a metal matrix composite core as required by Applicants. Rather, using the reference numbers provided above for this portion of '568 (Hannen), it is understood, in regard to FIG. 1, a (inner) metal tube 1 made of a non-ferrous metal (preferably aluminum) that encloses at least one optical fiber 2 is described and shown. The optical fibers 2 are in a filler material (preferably a thixotropic gel) which fills the space of the metal tube 1. Although other details are provided at col. 4, lines 3-19 regarding FIG. 1, Applicants are unclear where there is support for the statement in the Office Action that '568 (Hannen) "teaches that a composite wire or cable that includes fibers 2 disposed in a metal matrix 1" can be found. Clarification is respectfully requested.

Given that it is not clear, for example, how or where '568 (Hannen) teaches "the use of a metal cladding on a composite core structure comprising fibers in a metal matrix [for the known purpose of] providing the formed wire with enhanced properties," it submitted that the Office Action fails to set forth a prima facie case of obviousness.

Claims 2-24 depend directly or indirectly from claim 1. Claim 1 is patentable, for example, for at least the reasons given above (i.e., Applicants reserve the right to provide additional arguments, including disagreements with statements made in the Office Actions with respect to the prior art). Therefore, claims 2-24 should also be patentable.

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Claims 26-47 depend directly or indirectly from claim 25. Claim 25 is patentable, for example, for at least the reasons given above (i.e., Applicants reserve the right to provide additional arguments, including disagreements with statements made in the Office Actions with respect to the prior art). Therefore, claims 26-47 should also be patentable.

In summary, the rejection of claims 1-47 under 35 USC §103(a) as being unpatentable over '270 (McCullough et al.) in view of '568 (Hannen) should be withdrawn.

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In view of the above, it is submitted that the application is in condition for allowance.
Reconsideration of the application is requested.

Allowance of claims 1-47 at an early date is solicited.

Respectfully submitted,

August 16, 2006
Date

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